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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/023,831	12/21/2001	Paul Richard Vaughan	Q-67867	4805

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EXAMINER	
SULLIVAN, DANIEL M	
ART UNIT	**PAPER NUMBER**
1636	

DATE MAILED: 11/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/023,831	VAUGHAN ET AL.	
	Examiner	Art Unit	
	Daniel M. Sullivan	1636	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *31-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *31-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 28 March 2005 has been entered.

Claims 31-35 were considered in the Final Office Action mailed 28 September 2004. Claims 31-35 were amended in the 28 March Paper. Claims 31-35 are presently pending and under consideration.

Response to Amendments and Arguments

Claim Rejections - 35 USC § 112, first paragraph

Rejection of claim 35 under 35 U.S.C. 112, first paragraph, as lacking enablement for the full scope of the claim is **withdrawn** in view of the amendments thereto.

Claims 31-33 **stand rejected** under 35 U.S.C. 112, first paragraph, as lacking enablement for the full scope of the claimed subject matter for reasons of record and herein below in the response to arguments.

It was indicated in the previous Office Action that the specification, while being enabling for a hydroxylated triple helical protein wherein the protein is a collagen, does not reasonably provide enablement for the broad scope of polypeptides encompassed by the claims. The

rejection was made on the grounds that, although the art teaches that collagens are therapeutically useful, neither the art nor the instant specification teaches how any protein having the structure of a hydroxylated triple helical protein can be applied therapeutically. The skilled artisan armed with no more than the teachings available at the time of filing would not know how to use the vast majority of therapeutic products encompassed by the claims, and would not be able to distinguish which hydroxylated triple helical proteins could be substituted for collagen in therapeutic applications without having to resort to blind trial and error experimentation to make and test each of the proteins encompassed by the claims. Given the tremendous scope of the claims this would clearly require undue experimentation. Therefore, practicing the claimed invention commensurate with its full scope would require undue experimentation.

Response to Arguments

Applicant traverses the rejection of claims 31-33 under 35 USC §112, first paragraph, as lacking enablement for the full scope of the claimed subject matter on the grounds that the specification makes clear that the hydroxylated triple helical protein of the invention is capable of being used in applications other than therapeutic applications. In support of this contention, Applicant cites teachings from the specification indicating that the proteins "can include exogenous biologically active domains to provide additional protein function and other characteristic" and "the product-encoding nucleotide sequences may include a sequence(s) encoding a secretion signal". Applicant also cites Examples 7, which demonstrates synthesis of a hydroxylated triple helical protein wherein a Flag epitope is linked to a "SYN-C3" triple helical forming sequence. Applicant urges that the Flag epitope allows for easy separation of the

hydroxylated triple helical protein through immunochromatography and concludes that since the claims are not limited to a therapeutic application, it is clear that the claims are enabled by the present specification.

These arguments have been fully considered but are not deemed persuasive. As discussed in the Office Action mailed 26 January 2004, "with regard to using the claimed polypeptides, the specification teaches that the products may be used in a wide range of applications including bioimplant production, soft and hard tissue augmentation, wound/burn dressing, sphincter augmentation fur urinary incontinence and gastric reflux, periodontal disease, vascular grafts, drug delivery systems, cell delivery systems for natural factors and as conduits in nerve regeneration" (paragraph bridging pages 4-5). The teachings cited by applicant merely contemplate ways in which the claimed polypeptide can be modified or isolated. They are not teachings of how to use the polypeptide so modified or isolated. As discussed in previous Office Actions, the only uses contemplated in the specification for the claimed polypeptide are therapeutic.

Furthermore, as pointed out in the Office Action mailed 26 January 2004, the claims are generic to a vast array of hydroxylated triple helical proteins and are not limited to having any particular useful property (second paragraph on page 4) and the art recognizes that aggregation of collagen fibrils can be disrupted by a variety of mutations (first full paragraph on page 5). Given the tremendous scope of the claims and the unpredictable nature of the claimed invention, the skilled artisan would recognize that the claims embrace a tremendous number of inoperative embodiments. Although, the presence of inoperative embodiments within the scope of a claim does not necessarily render a claim nonenabled, the standard is whether a skilled person could

determine which embodiments that were conceived, but not yet made, would be inoperative or operative with expenditure of no more effort than is normally required in the art. *Atlas Powder Co. v. E.I. du Pont de Nemours & Co.*, 750 F.2d 1569, 1577, 224 USPQ 409, 414 (Fed. Cir. 1984). In the instant case, given the scope of the claims and the unpredictability of the art, determining which embodiments that were conceived, but not yet made, are inoperative or operative would clearly require undue experimentation.

Applicant's arguments have been fully considered but are not deemed persuasive in view of the record as a whole. Therefore, the claims stand rejected under 35 USC §112, first paragraph.

Claims 31-35 **stand rejected** under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement because the claims contain new matter for reasons of record and herein below in the response to arguments.

As stated in the Advisory Action mailed 8 April 2005, Applicant's argues persuasively that the application as filed contains adequate support for the limitation of (GlyXY)n to n=2 to 50. However, Applicant's arguments are not deemed persuasive regarding support for the proviso "at least one of m and o is 1".

The rejection set forth in the 28 September Office Action states, "[c]laim 31 has also been amended such that the description of terms B and C includes the proviso "at least one of m and o is 1". The examiner can find no explicit support for this proviso in the originally filed specification and can find no statement that would clearly convey to one of ordinary skill a subgenus which excludes embodiments wherein both m and o are zero. In fact, the original

disclosure explicitly states that the values for m and o are 'selected independently'. In contrast, in the amended claim, the value assigned to m is dependent upon the value of m (*i.e.*, if o is 0 m cannot be 0) and *vice versa*. Thus, the limitation of the claimed subject matter to exclude a subset of embodiments wherein both m and o are zero is neither explicitly nor implicitly supported by the originally filed disclosure."

Response to Arguments

In support of the proviso, applicant cites a teaching at page 2, lines 4-9, stating that the synthetic collagen "may include, for example, exogenous biologically active domains" (emphasis added), which applicant asserts provides support for the requirement that at least one of "l", "m", "n" or "o" is 1. Applicant also points to a teaching at page 7, lines 12-13, that states, "triple helical proteins may include non-collagenous, non-triple helical domains at the amino and/or carboxy terminal ends or **elsewhere**" (under lining added herein, bold added in Applicant's remarks) and a teaching at page 8, lines 17-30, which refers to the possibility of polypeptide domains being A, B, C and/or D. Applicant urges that these teachings provide blaze marks to "m" or "n" being 1 or both "m" and "n" being 1.

This argument has been fully considered but is not persuasive because a statement that the protein can comprise embodiments wherein "m" and/or "o" are 1 does not support the requirement that if "m" is 0, "o" must be 1 and if "o" is 0, "m" must be 1 as the claims are limited by the proviso. As stated in the *prima facie* rejection, the original disclosure explicitly states that the values for "m" and "o" are "selected independently". When an explicit limitation in a claim "is not present in the written description whose benefit is sought it must be shown that

a person of ordinary skill would have understood, at the time the patent application was filed, that the description requires that limitation." *Hyatt v. Boone*, 146 F.3d 1348, 1353, 47 USPQ2d 1128, 1131 (Fed. Cir. 1998). In contrast to limitations of the amended claims, wherein the value assigned to "m" is dependent upon the value of "o" (*i.e.*, if "o" is 0 "m" cannot be 0) and *vice versa*, the original disclosure teaches that the previous recitation that the values of "o" and "m" are independent (see, *e.g.*, original claim 31).

Thus, the limitation of the claimed subject matter to exclude a subset of embodiments wherein both "m" and "o" are zero is neither explicitly nor implicitly supported by the originally filed disclosure.

Applicant's arguments have been fully considered but are not deemed persuasive in view of the record as a whole; therefore, the claims stand rejected for reasons of record.

Claim Rejections - 35 USC § 102

Rejection of claims 31-33 under 35 U.S.C. 102(b) as being anticipated by Fields *et al.* (1996) *Lett. Peptide Sci.* 3:3-16 is **withdrawn**. The claims have been amended such that they are directed to a "recombinant" hydroxylated triple helical protein, while the teachings of Fields *et al.* are directed to synthetic collagens comprising spacer domains that would not be comprised in recombinantly expressed proteins.

Rejection of claims 31 and 32 under 35 U.S.C. 102(b) as being anticipated by any one of Swiss-Prot database entries P02745 (1986), P07714 (1988), P35247 (1994), P11226 (1989),

P23805 (1991), or P21757 (1991) is **withdrawn**. The Swiss-Prot database entries disclose naturally occurring proteins, not synthetic proteins.

Claims 31-35 **stand rejected** under 35 U.S.C. 102(e) as being anticipated by St. Pierre *et al.* U.S. Patent No. 5,856,308 (filed 27 September 1996) for reasons of record and herein below in the response to amendment and arguments.

Response to Amendments and Arguments

Applicant has amended the claims to recite that the claimed polypeptides are "recombinant". Applicant urges, "St. Pierre is similar to that of Fields *et al.* in that the peptides therein are described as being synthesized by a chemical synthesis protocol, as opposed to being recombinantly produced" (first paragraph on page 7).

These arguments have been fully considered but are not deemed persuasive. As described in the 28 September Office Action, in Formula A (column 3), St Pierre *et al.* describes a hydroxylated triple helical protein according to the limitations of claim 31 and wherein the protein comprises a "polymer". In column 5, line 60, St. Pierre *et al.* teaches that this polymer can be a peptide selected from polyglutamic acid, polyaspartic acid and polylysine, which meets the limitation of at least one peptide domain which is heterologous to collagen proteins and which does not comprise a triple helical forming repeating sequence. Furthermore, in the first full paragraph in column 6, St. Pierre *et al.* teaches that the oligopeptide strands that are comprised by the triple helical protein, "can be prepared as fusion proteins or peptide fragments thereof from appropriate genetically-engineered expression vectors in suitable host cells." Given

that hydroxylation and formation of the recited triple helical structure would be inherent to expression of the oligopeptide strands in suitable host cells as taught by St. Pierre *et al.*, the recombinantly produce artificial collagen contemplated by St. Pierre *et al.* is the same as the artificial collagen of the instant claims. Therefore, the products described by St. Pierre *et al.* comprise all of the limitations of the presently claimed invention and anticipate the claims as amended.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel M. Sullivan whose telephone number is 571-272-0779. The examiner can normally be reached on Monday through Friday 6:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Remy Yucel, Ph.D. can be reached on 571-272-0781. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel M Sullivan, Ph.D.
Examiner
Art Unit 1636

DANIEL M. SULLIVAN
PATENT EXAMINER